

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Apparatus for recognizing a string of characters of hand written text in an image loaded in a computing system, the apparatus comprising:

holistic recognition means for recognizing the string of characters as a whole and generating a first answer list and a segmentation list, the first answer list containing a plurality of recognition answers for the string of characters in the image each answer having a confidence value that the answer is correct, the segmentation list containing segmentation information separating ~~the character features making up~~ each character in the answers;

analytical recognition means responsive to the segmentation list for recognizing a plurality of characters individually and generating a second answer list for the string of characters in the image each answer having a confidence value that the answer is correct; and

means responsive to the first answer list and the second answer list for finding the best recognition answer for the string of characters.

2. (Currently Amended) In a computing system for processing information loaded as cursive text, a method for recognizing the cursive text to provide digital information corresponding to the cursive text, the method comprising:

- loading into the computing system an image of an input phrase of cursive text;
- identifying features of the input phrase, each feature representing at least a portion of a character in the input phrase;
- matching features of the input phrase against features of a plurality of reference phrases and generating a holistic answer list containing as answers reference phrases that are most similar to the input phrase along with a confidence value, the confidence value for each answer being a measure of similarity between features of the input phrase and the features of the reference ~~phase~~ phrase;
- constructing a character segmented features list from the features of the input phrase and from the holistic answer list, the character segmented features list being a list of character ~~features segmented into~~ feature sets segmented by characters in each answer from the holistic answer list;
- translating the image of the input phrase into images of a characters segmented according to answers in the holistic answer list ~~input phrase~~ based upon the character segmented features list;
- ~~matching~~ analytically recognizing character image variants of characters in the input phrase from the images of characters segmented according to answers in the holistic answer list against reference character images and generating an analytical answer list containing analytical answers for the input phrase ~~phrases~~, each analytical answer having a confidence value as a measure of the similarity between a characters in the analytical answer ~~image variant of the input phrase and the reference~~ characters images in a reference phrase; and
- finding the best recognition answer from the answers on both the holistic answer list and the analytic answer list.

3. (Currently Amended) In a handwritten character recognition system a method for recognizing an input word of handwritten text in an image provided to the recognition system, the method comprising:

identifying from the input word image an input string of metastrokes where each metastroke represents a portion of an alphanumeric character in the text;

storing the input string of metastrokes as character feature images;

comparing as a whole the input string of metastrokes to a prototype string of metastrokes for reference words to generate a first recognition answer list having a plurality of possible answers;

creating a plurality of character segmentation hypothesis based on character segmented metastrokes for answers in the first recognition answer list;

translating each character segmentation hypothesis into character cutout images of the input word;

~~matching recognizing characters from~~ the character cutout images ~~against variants of reference character images~~ and generating a plurality of character variants for each character position in the input word based on ~~and~~ each segmentation hypothesis;

interpreting the plurality of character variants of the input word for each segmentation hypothesis based on a vocabulary and generating a second recognition answer list having a plurality of possible answers; and

finding a best answer from the first and second answer lists as the recognition of the input word.

4. (Previously Added) The apparatus of claim 1, wherein the string of characters is a series of alphanumeric characters and spaces that make up a word, a sequence of words, one or more numbers, or a mix of words, alphabetic characters and numbers.

5. (Previously Added) The apparatus of claim 1, wherein means for finding comprises:
means for matching one or more recognition answers of the first answer list to one or more recognition answers of the second answer list to generate one or more matching answer pairs, each matching answer pair having an associated combined confidence value; and
means for evaluating the combined confidence value associated with each matching answer pair to designate a matching answer pair having a highest combined confidence value as the best recognition answer.

6. (Previously Added) The apparatus of claim 5, wherein the combined confidence value associated with each matching answer pair is defined by an average of the confidence values of the recognition answer of the first answer list and the recognition answer of the second answer list of the matching answer pair.

7. (Previously Added) The apparatus of claim 5, wherein the means for finding comprises:
means for testing the highest combined confidence value against a next to highest combined confidence value to define an answer separation value; and
means for rejecting the matching word pair associated with the highest combined confidence value as the best recognition answer if the answer separation value is less than a predetermined threshold value.

8. (Previously Added) The apparatus of claim 1, wherein the means for finding comprises:
means for evaluating a highest confidence value of the first answer list and a highest confidence value of the second answer list against a probability algorithm to identify the best recognition answer for the string of characters.

9. (Previously Added) The method of claim 2, wherein the input phrase and each reference phrase is a series of alphanumeric characters and spaces that make up a word, a sequence of words, one or more numbers, or a mix of words, alphabetic characters and numbers.

10. (Previously Added) The method of claim 3 further comprising:

identifying each of the plurality of possible answers of the first recognition answer list with a metastroke confidence value corresponding to a degree of similarity between the metastrokes representing the input word and the prototype string of metastrokes associated with each possible answer in the first recognition answer list; and

identifying each of the plurality of possible answers of the second recognition answer list with a confidence value based on a character recognition confidence value of each character variant in each possible answer in the second recognition answer list, the character recognition confidence value corresponding to a degree of similarity between the character variant and the matched character cutout image.

11. (Previously Added) The method of claim 10, wherein the operation of identifying each of the plurality of possible answers of the second recognition list comprises:

combining the character recognition confidence value of each character variant in each of the plurality of possible answers of the second recognition answer list to generate a resultant confidence value for each of the plurality of possible answers.

12. (Previously Added) The method of claim 11, wherein the finding operation comprises:

matching one or more possible answers of the first recognition list to one or more possible answers of the second recognition list to produce one or more matching answer pairs;

combining the metastroke confidence value associated with the possible answer of the first recognition answer list and the resultant confidence value associated with the possible answer of the second recognition answer list in each matching pair to define a combined confidence value for each pair; and

designating the matching answer pair having a highest combined confidence value as the recognition of the input word.

13. (Previously Added) The method of claim 12, wherein the finding operation further comprises:

testing the highest combined confidence value against a next to highest combined confidence value to define an answer separation value; and

rejecting the matching word pair associated with the highest combined confidence value as the recognition of the input word if the answer separation value is less than a predetermined threshold value.

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Amendments to the Drawings:

The attached sheets of drawings replace all of the original drawing sheets. Figs. 2, 3 and 6 were previously amended in a preliminary amendment to provide formal drawings for handwritten corrections in original drawings as filed. It appears from the office action that the preliminary amendment of the drawings was not clear. Therefore, the amendment of the drawings as originally filed is repeated in this amendment, and a complete set of corrected drawings is enclosed. Only Figs. 2, 3 and 6 of the original drawings have been amended.

The changes made relative to the drawings as originally filed are as follows:

In Fig. 2, the spelling of "Volitile" (two occurrences) has been corrected to -- Volatile -- in Memory block 204.

In Fig. 3, reference numerals 307 and 309 have been added; a gap in edge of block 308 has been closed; the spelling of "Charcter" has been corrected to -- Character -- in block 318; and a flow line from Match operation 308 to Holistic Word Answers 311 has been moved to improve appearance.

In Fig. 6, the word "Chose" has been changed to -- Choose -- in operation 606.

Attachment: Replacement Sheets For All Drawing Sheets